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ABSTRACT

A study compared the word recognition errors of learning disabled readers using reading instructional level materials (word recognition rates between 3% and 9% and frustration level materials (word recognition rates greater than 9%). Subjects, eight learning disabled students chosen randomly from second, fifth, eighth, and eleventh grade levels, were tape-recorded as they read aloud from several texts of varying degrees of difficulty. The tape transcripts were then analyzed for basic miscues (insertions, omissions, teacher-pronounced, and substitutions), reversal errors, substitution types, and linguistic acceptability. Results indicated that: (1) the production of fewer semantically than syntactically acceptable miscues was a pattern for learning disabled as well as normal readers; (2) both syntactic and semantic acceptability was higher for the instructional range than for the frustration range; (3) range of text difficulty was not a factor in the production of differential rates of basic miscues, types of substitution errors, or reversal errors; (4) the eighth grade group produced a greater mean percentage of miscues of all substitution types than the other three grade levels; (5) the eleventh grade group produced a greater mean percentage of linguistically acceptable miscues than the other three grade level groups; and (6) substitutions were the miscue type with the highest rate of production. Findings support the premise of the study, namely, that the production of various miscue patterns has been mistakenly viewed as characteristic of learning disabled readers, when in fact it is more accurately attributed to the use of frustration rather than instructional range materials. (Four tables of data are included; 45 references are attached.) (RS)

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The Oral Reading Errors of Learning Disabled Readers: Variations Produced Within the Instructional and Frustration Ranges

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Running head: INSTRUCTIONAL AND FRUSTRATION RANGE VARIATIONS

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Abstract

The purpose of this study was to examine the word recognition abilities of learning disabled (LD) readers at four grade levels: grades 2, 5, 8, and 11. The study's premise was that previous findings in relation to the word recognition abilities of LD readers have been confounded by the use of frustration level materials for these readers. Therefore, this study compared the word recognition errors of LD readers when they were reading instructional level materials (between 3% and 9% word recognition errors) and frustration level materials (greater then 9% word recognition errors). The word recognition errors considered by this study were basic miscues (substitutions, omissions, insertions, teacher-pronounced); substitution types: reversal errors: linguistic acceptability (syntactic and semantic). The premise of this study was supported in terms of the categories of linguistic acceptability, but not in the other categories.

The Oral Reading Errors of Learning Disabled Readers: Variations Produced Within the Instructional and Frustration Ranges

The purpose of this study was to investigate the word recognition abilities of learning disabled (LD) readers at four grade levels: second, fifth, eighth, and eleventh. This study focused on the differences between the miscues made by these subjects when they were reading materials within two difficulty ranges, instructional and frustration. For this study the instructional range was defined as a word recognition error rate of between 3% and 9% (Cooper, 1952; Pikulski, 1974; Powell, 1973), while the frustration range was defined as greater than 9% word recognition error rate (Betts, 1946; Pikulski, 1974; Powell, 1973). This study of word recognition abilities of LD readers is important because of the extensive amount of time spent on word recognition instruction for LD readers. This amount of time far exceeds that spent on word recognition for normal readers, because the word recognition abilities of the LD readers are viewed as being much less skilled than normal readers.

Various studies have led educators to several beliefs about the miscue patterns of disabled readers. For example, disabled readers have been shown to be less likely than normal readers to self-correct their errors regardless of

the linguistic acceptability of the errors (Beebe, 1979-1980; Bowney, 1985; Chittendon, 1984; D'Angelo, 1982; Leibert, 1982; Pflaum & Pascarella, 1980; Wixson, 1979). Poor readers are also known to be less likely to omit nonessential words than proficient readers (Y. Goodman, 1976; Greene, 1974). Dyslexic readers have been found to have more difficulty at the graphic and phonemic levels than at the syntactic or semantic (Thomson, 1979; Vellutino & Scanlon, 1986). Some research has shown that learning disabled readers can be expected to produce more reversal errors than normal readers (Barrett, 1965; Harris & Sipay, 1990; Jansky & de Hirsch, 1972; Orton, 1937; Vellutino, 1987).

However, some of these characteristics, which appear when disabled students read for miscue analysis, do not seem to appear in classroom instruction. The failure of these characteristics to appear in classroom situations can raise doubts about their applicability to disabled readers. One explanation of this apparent conflict lies in the nature of the texts used for these two types of tasks, reading for miscue analysis and reading during classroom instruction. Classroom instruction is most often conducted using materials that are in the instructional range for each individual reader. By contrast, much of the text for miscue analysis involves presenting the same materials to both good and poor readers. The result of this practice is that the

good readers read material that is comparatively easy for them, possible even within the independent range (less than 3% word recognition errors). For the poor readers, this same material is comparatively difficult, and therefore may produce a frustration range performance (Blemiller, 1979; Christie & Alonzo, 1980; Hood & Kendall, 1975; K. Goodman & Burke, 1973; Leu, 1982; Pikulski & Shanahan, 1982; Tamor, 1979).

Some previous research with a different focus has in fact suggested that the difficulty of the text materials can affect the rates of various miscue types. For example, Kibby (1979) reported that readers were found to produce fewer syntactically acceptable responses on "difficult" passages than on "easy" passages, while others (Fleisher, 1988; Niles and Hutson, 1981) found that readers made increasingly fewer linguistically acceptable miscues as the materials increased in difficulty. Some research has found that this effect is greater in young readers than in older readers (Schwantes, 1981). It is possible to hypothesize that the apparent differences between the two ability groups in many studies are actually generated by their different responses to the same difficulty of text materials. If this were the case, it could be predicted that the LD readers in this study would display the patterns predicted by the literature when reading frustration range material, and a different pattern when reading instructional range material.

In an effort to separate the effects of reading ability from text difficulty, for this study each reader was tested at two different levels of text difficulty: materials within the readers' instructional range (between 3% and 9% error rate) and materials within their frustration range (greater than 9% error rate). Much of the literature in this area involves the linguistic acceptability of the miscues. On the basis of that literature, it was predicted that the syntactic acceptability rate would be higher than the semantic acceptability in both difficulty ranges (Allen, 1969; Aulls, 1981; Burke, 1969; Burke & K. Goodman, 1970; Y. Goodman, 1976; Leslie, 1980; Willows & Ryan, 1976). It was also predicted that both the syntactic and semantic acceptability rates would be lower for the frustration range performances than for the instructional range performances.

This study dealt with word recognition exclusively. According to some research (Harris & Sipay, 1990; Wixson, 1979), the connection between the percentage of miscues and the rate of comprehension has not been firmly established, and may in fact vary inversely in some students. It was decided not to test for comprehension in this study because learning disabled students who display a word recognition problem are commonly viewed as requiring remediation whether or not they also display a comprehension problem.

Research Questions

This study was devised in order to answer three questions. First, are there differences for LD readers in their error rates for the various miscue types when their rates in the instructional range are compared to the frustration range? Second, are there differences for LD readers in their error rates for the various miscue types when grade levels are compared? Third, are there differences for these learning disabled readers in the rates of production of the various types of miscues?

Method

Subjects

The subjects in this study were 8 learning disabled readers from each of four grade levels, grades 2, 5, 8, and 11, for a total of 32 subjects. These subjects were randomly selected from a group of those at each grade level who were labeled as learning disabled (LD) in reading skills by the use of an aptitude-achievement discrepancy model of diagnosis. These students attended daily instruction in an LD resource room for a reading disability. This study did not control for differences in students' ages within each grade level, IQ (by definition, within the normal range), handicapping condition other than learning disabilities, or history of retention in grade. All subjects who participated in this study provided written parental

permission prior to testing, and also verbally expressed a willingness to participate at the time of testing.

Texts

The materials used in this study were all narrative texts, whose length varied with the grade levels of the students who read them. The purpose of this variation was to provide as long a passage as practical for each student without inducing fatigue. Students in the second grade read passages of between 240 and 540 words, with a mean of 336 words. Students in the fifth grade read passages of between 330 and 647 words, with a mean of 495 words. Students in the eighth and eleventh grades read passages of between 477 and 900 words, with a mean of 624 words. No subjects read passages with which they had previous experience. The passages were taken either from basal readers which were different from those used in the subjects' schools, or from the writings of Herman Melville, Sir Walter Scott, and Charles Dickens. This study did not control for interest in particular subject matter, since this is not a factor in the scoring of oral reading inventories. However, all materials were common to reading or content area classrooms.

No two subjects in this study read the same passages, because the use of a limited selection of text materials is subject to the fallacy of language as fixed effect (Clark,

1973). According to Clark, when a test consists of a limited sample of text materials, it is not possible to determine whether or not the results of the test are generalizable to other language materials. For this reason, it was considered advisable to broaden the selection of text materials to increase the generalizability of the results.

Test Administration

Subjects were told that the examiner was looking into the oral reading behavior of students of various ages. They were asked to help the examiner do this by reading aloud from several texts, just the way they would read any school work, and that they would not be asked any questions. They were told that some of the texts would be fairly easy, while others would be harder. The students were then asked if they were willing to help: those who were unwilling were dismissed. For those willing to assist, the examiner then provided a 3-4 sentence description of the text that was to be read. For example, for Moby Dick, the examiner said, "Moby Dick is an adventure story about whale hunting, written about two hundred years ago. It tells the story of a great white whale, Moby Dick, who had injured the ship's captain, Ahab, years before. Now, Ahab is obsessed with finding and killing Moby Dick." The students then read the passages aloud onto audio tape.

The statement of purpose for reading was the same for all readers: to help the investigator, and to read aloud just as they would read any school-work. While as a purpose for reading, this statement was perhaps not very powerfully motivating, it was at least similar for all readers, and similar to tasks which are commonly required of readers in school.

Each subject read 1, 2, or 3 texts which were at the time of reading informally judged by the examiner to produce at least one text in the instructional range and one in the frustration range. These informal judgments were later checked by actual enumeration of miscues. For some students, it was found that they did not produce both an instructional and a frustration range performance: these students were eliminated as subjects. Other students did produce at least one text in each required difficulty range. From these texts with appropriate error rates, one text was selected at random in the instructional range and one in the frustration range for each student. The remaining texts were eliminated from further consideration.

Data Analysis

The tape transcripts were analyzed for the following basic miscue types: insertions (including all additions), omissions (including line skips, counted as a single omission), teacher-pronounced (after a 5 second hesitation

or by reader's request), substitutions, reversal errors, and self-corrections.

Substitutions were further analyzed for the following error types:

nonsense words (non-word letter strings);

inflections (any varying form of the text word);

irregular words (substitutions for the text word if the text word cannot be decoded phonetically);

proper nouns;

one error to correct another (for example, a change from singular to plural for a verb, when a prior miscue changed the subject of the sentence from singualr to plural);

whole word substitutions (in which fewer than three letters in the substitutions were the same as the text word);

error in prefix (or first syllable of the text word);

error in suffix (or last syllable of the text word);

error in stress.

Reversal errors were enumerated and coded for the following characteristics: letter reversals, also known as orientation errors (for example, <u>p</u> for <u>g</u>); word part reversals, also known as sequencing errors (for example, <u>except</u> for <u>expect</u>); whole word reversals (for example, <u>on</u>

for no): phrase reversals (for example, she said for said she): and total reversal errors.

Each error was counted as one error (regardless of whether or not it was self-corrected) for the purpose of determining the total percentage of miscues in a passage. However, the same error could be coded and counted in several categories simultaneously. For example, if the word in the text was wasn't, and the child read it as were, this error would be counted as an error in three different categories for that child: inflection (was for were, a change from singular to plural); suffix (omission of the not contraction in the second syllable); whole word substitution (because only one letter in the stimulus and the substitution were the same); and irregular word (phonetically non-decodable stimulus word, were). The result of this practice is that when the sum is taken of the percentages of the various miscue types, that sum may equal more than 100% of the total miscues for any given child.

In addition, each miscue was analyzed for five types of linguistic acceptability. The category of syntactically acceptable to the error was defined as that in which the syntactic context preceeding the error within the same sentence was considered. The category of syntactically acceptable with the sentence was defined as that in which the syntactic context of the entire sentence in which the error occurred was considered. The category of semantically

acceptable to the error was defined as that in which the semantic context preceeding the error within the same sentence was considered. The category of semantically acceptable with the sentence was defined as that in which the semantic context of the entire sentence in which the error occurred was considered. The category of semantically acceptable with the author's intent was defined as that in which the context of the entire passage was considered, in terms of the examiner's interpretation of the author's intent.

For each subject, the instructional- and frustration-range texts were considered separately, and the miscue types enumerated for each. The number of errors in each category was then calculated as a percentage of the total number of errors in that text. This use of percentages of errors to determine error rate is typical of that used in the common methods of miscue analysis, as described by Harris and Sipay (1990).

Four three-way analyses of variance were conducted. In each, if main effects were found, Tukey's procedure was conducted for the purpose of rank-ordering the groups involved. For each ANOVA, the four grades were grades 2, 5, 8, and 11; the two difficulty ranges were instructional and frustration. The first analysis of variance was a three-way, 4 x 2 x 4 (Grade x Range x Basic Miscue) ANOVA; the second, a three-way, 4 x 2 x 9 (Grade x Range x

Substitution Type) ANOVA: the third, a three-way, 4 x 2 x 5 (Grade x Range x Reversal) ANOVA: the fourth, a three way, 4 x 2 x 5 (Grade x Range x Linguistic Acceptability) ANOVA.

Results

The report of the results of the statistical analyses will include only main effects. Readers who are interested in a full descriptyion of the analyses, including main effects, interactions, and the graphs and tables representing them, should contact the author.

Basic Miscues

Results indicated a main effect for miscue type, $F = 1264.51$, df 3, $p < .01$. Tukey's procedure was applied to the significant differences found in this main effect. Results indicated that there were three groups which were significantly different from each other, and which are reported here ranked from highest to lowest: (a) Substitutions, $\overline{X} = 76.42$; (b) Teacher-pronounced words, $\overline{X} = 10.40$; and, (c) taken together, Insertions, $\overline{X} = 7.52$, and Omissions, $\overline{X} = 5.74$. These data are presented in Table 1.

There were no main effects for grade or range.

Insert Table 1 about here

Substitutions

Results indicated a main effect for grade, $F = 7.08$, df 3, $p < .01$. When Tukey's procedure was applied to these results, three groups were found to be significantly different from each other. These are reported here ranked from highest to lowest: (a) Grade 8, $\overline{X} = 10.83$; (b) taken together, Grade 5, $\overline{X} = 9.49$, and Grade 2, $\overline{X} = 8.45$; and, (c) Grade 11, $\overline{X} = 7.67$.

Results further indicated a main effect for substitution type, $F = 81.19$, df 8, $p < .01$. When Tukey's procedure was applied to these results, seven groups were found to be significantly different from each other. These are reported here ranked from highest to lowest: (a) Irregular words, $\overline{X} = 18.51$; (b) Whole words, $\overline{X} = 10.08$; (c) Inflections, $\overline{X} = 13.33$; (d) taken together, Suffixes, $\overline{X} = 11.39$, and Nonsense words, $\overline{X} = 10.95$; (e) Proper nouns, $\overline{X} = 4.97$; (f) taken together, One error to correct another, $\overline{X} = 2.14$, and Prefixes, $\overline{X} = 1.14$; and (g) Stress, $\overline{X} = .22$. These data are reported in Table 2.

There was no main effect for range.

Insert Table 2 about here

Reversal Errors

Results indicated a main effect for reversal type, F = 57.68, df 4, $p < .01$. When Tukey's procedure was applied to these significant differences, three groups were found which were significantly different from each other. These are reported here ranked from highest to lowest: (a) Total reversals, $\overline{X}$ = 6.98; (b) Word part reversals, $\overline{X}$ = 5.13; and, (c) taken together, Letter reversals, $\overline{X}$ = .75, ~~and~~ Phrase reversals, $\overline{X}$ = .69, and Whole word reversals, $\overline{X}$ = .37. These data are reported in Table 3.

There were no main effects for grade or range.

Insert Table 3 about here

Linguistic Acceptability

The results of this analysis indicated three main effects. The first of these was for grade, F = 5.45, df 3, $p < .01$. When Tukey's procedure was applied to these significant differences, two groups were found which were significantly different from each other. These are reported here ranked from higher to lower: (a) Grade 11, $\overline{X}$ = 55.08; and, (b) taken together, Grade 8, $\overline{X}$ = 50.72, Grade 5, $\overline{X}$ = 49.37, and Grade 2, $\overline{X}$ = 48.68.

The second main effect was for linguistic acceptability, F = 512.12, df 4, $p < .01$. When Tukey's

procedure was applied to these significant differences, two groups were found which were significantly different from each other. These are reported here ranked from highest to lowest: (a) Syntactically acceptable to the error, $\overline{X}$ = 84.39; (b) Semantically acceptable to the error, $\overline{X}$ = 80.73; (c) Syntactically acceptable with the sentence, $\overline{X}$ = 43.43; (d) Semantically acceptable with the sentence, $\overline{X}$ = 34.64; and, (e) Semantically acceptable with author's intent, $\overline{X}$ = 11.62. The third main effect was for range, F = 9.50, df 1, $p < .01$. By examining the means for these groups, it is possible to observe that the linguistic acceptability of the responses in the instructional range, $\overline{X}$ = 52.86, was greater than that in the frustration range, $\overline{X}$ = 49.07. These data are reported in Table 4.

Insert Table 4 about here

Discussion

Differences in Range

The major point of this study was to determine the differences in miscue types that were generated when learning disabled children read texts of two ranges: instructional and frustration. Such differences in range occurred in only one case, that of linguistic acceptability.

In a review of this literature, Wixson (1979) found that it could be expected that normal readers at all grade levels would produce fewer semantically acceptable miscues than syntactically acceptable miscues; however, it was not known if this pattern would also hold for learning disabled readers. The present research supports the contention that the production of fewer semantically than syntactically acceptable miscues is a pattern for learning disabled readers as well as normal readers.

A further prediction was that both syntactic and semantic accpetability would be higher for the instructional range than for the frustration range. This too was confirmed. This also suggests that, in regard to miscues, the conclusions that have previously been applied to the population of normal readers can also be applied to learning disabled readers.

Differences in Grade Level

The eighth grade group produced a greater mean percentage of miscues of all substitution types than the other three grade levels. This suggests that for the subjects in this study, the tendency to make substitution errors peaked at around the eighth grade, and by the eleventh grade, dropped off again to the second and fifth grade levels. All readers of all grades made more substitution errors than any other miscue type.

The eleventh grade group was found to produce a greater mean percentage of linguistically accpetable miscues than the other three grade level groups. It must be noted that the eleventh graders' error rates overall were not significantly different from the error rates of the students in the other three grade levels, and therefore this higher rate of linguistically acceptable miscues cannot be the result of lower miscue rate. While this study did not measure comprehension directly, the percentage of linguistically acceptable miscues is felt to vary in direct proportion with comprehension. Therefore, the results reported here suggest that the eleventh graders were actually understanding what they read better than the other, younger readers, in spite of having a similar overall error rate. the eleventh graders have had several additional years of contact with text that readers at the other grade levels have not had. It is possible that this additional contact gave these eleventh grade readers a better grasp of the syntactic and semantic structure of discourse, which aided them in producing linguistically acceptable miscues.

Differences in Miscue Type

Differences in miscue type were found in all analyses. The first was for basic miscue type. Substitutions were by far the largest misuce group of the four types under consideration. This effect may be a commentary on the

definitions of the basic miscue types rather than on the miscue habits of the readers involved. Substitutions include all whole word replacements and all types of mispronunciations, while the other categories are much more restricted in the elements that may be included. In addition, the maen percentage of teacher-pronounced words was greater tha that of insertions and omissions. The high percentage of teacher-pronounced words may be a result of the use of LD subjects, who sometimes have a tendency to react with helplessness when faced whth unknown words, and the tendency of teachers and other children to pronounce unknown words for them.

Substitutions. The nine substitution types separated into seven ranked groups. Irregular words produced the highest mean percentage of errors. This replicates results found in a previous experiment in this series (Adams, 1987), in which LD readers produced a higher rate of miscues on irregular words than did normal readers. These results suggested then, as now, that LD readers have learned phonics rules for single syllable words, but still have problems with irregular words, which are non-decodable by phonic rules.

The second largest group of substitution miscues was for whole words. It is interesting that whole word substitutions tend to change in nature across the grade-level span involved in this study. At the lower grade

levels, the whole-word substitutions tend to be words that have been previously taught. By contrast, at the upper grade levels, they tend to be words that have not been taught directly, because of the increased emphasis placed on syllabication as a word identification strategy. But it is important to note that this group with the second highest percentage of substitution types is a group in which only one or two letters per miscue are the same as in the word which they replace.

Further analysis is required to determine whether or not these whole word substitutions have any higher linguistic acceptability than other substitutions which might have closer graphic similarity. If such higher linguistic acceptability exists, it would indicate that the readers are using semantic cues to the exclusion of graphic cues. If such higher linguistic acceptability does not exist, it would indicate that these readers use a high degree of blind guessing, rather than even educated guessing or informed guessing to substitute.

The third largest group of substitutions is that of inflections. This category is defined as miscues which are forms or inflections of the words in the text. The fact that this category results in a large percentage of miscues reflects a tendency of the LD population to attend to the general structure of the words in the text, but lack

attention to detail. For this reason, they read one form of the word when the text actually contains a different form.

The fourth group includes both suffixes and nonsense words. The fact that these LD readers produce more miscues involving suffixes than those involving prefixes suggests that these readers are attending better to the beginnings of words than to the endings. The substitution of nonsense words, or non-words, for text words is a comparatively less useful strategy than others, yet it seems to be one that these LD readers tend to rely upon.

The three remaining groups (proper nouns, one error to correct another, and stress errors) all comprised less than 5% each of the total of substitution errors. Because of these small percentages, these error types do not seem to be of great importance as substitution strategies for these LD readers. The one-error-to-correct-another type is a strategy that good readers employ when they are closely in touch with the semantic structure of the text, and less in touch with the graphophonic structure. It may be that the word-by-word style of which is characteristic of most LD readers (Harris & Sipay, 1990) works against their using such sentence level or discourse level strategies.

Reversal Errors. The largest of reversal error types was word part reversals. This replicates the results of a previous study in this series (Adams, 1988). This result, along with the results for inflections and irregular words,

seems to indicate that the LD readers in this study are able only partially to use the graphophonic information available in the text.

Linguistic Acceptability. The results of this analysis replicate with LD readers the results of previous studies with readers who are not learning disabled. In previous studies, it was found that for normal readers, the mean percentage of syntactically acceptable responses was higher than that for semantic acceptability in the to the error categories as well as in the with the whole sentence category. This seems to indicate that the normal readers are in closer touch with the syntactic structure of the text than with the semantic structure. The result of the present study suggests that the findings for normal readers can also be applied to the population of LD readers.

An additional finding was that the mean percentage of miscues that were syntactically acceptable to the error (when the context of the sentence up to the error was considered) was higher than the mean percentage of semantically acceptable to the error. The same pattern held true for the with the whole sentence category, with the mean percentage of semantically acceptable miscues lower than that of the syntactically acceptable miscues. This suggests that the readers were making more successful use of the context preceeding a miscue than the context that followed it.

The mean percentages of all other groups of linguistic acceptability were higher than that of semantically acceptable with author's intent. This suggests that, while the readers may be able to incorporate previous context fairly well, and the following context less well, they may not be in touch with the semantic structure of the text as a whole. It is possible to make this statement without having conducted a comprehension check because of the commonly accepted definition of this category of linguistic acceptability. By the commonly accepted definition, this category involves the readers' use of miscues which indicate that their interpretations of the authors' intended meanings are accurate. If these interpretations are accurate, we can assume that it is because they comprehended the authors' intended meanings.

This result also indicates that these readers are displaying their most appropriate syntactic and semantic strategies on chunks of text that are smaller than full sentence length.

Conclusions

There are several conclusions that may be drawn from this research study. The first is in relation to the first research question, are there differences for LD readers in their error types when their rates in the instructional range are compared to the frustration range? A difference

in range was found in one area: in terms of linguistic acceptability, readers produced more syntactically and semantically acceptable miscue responses when reading material in their instructional range than when reading material in their frustration range. This study, therefore, supports the premise that the rates of linguistic acceptability of the miscues of LD readers may depend on the difficulty of the texts they are reading. It challenges the research that suggests that the apparent difference between ability groups of readers is that LD readers in general produce fewer linguistically acceptable responses than normal readers. Any study which has as its purpose the determination of differences in linguistic acceptability between the miscues of LD and normal readers must be shown to be using instructional range materials for all ability groups, in order to avoid the confounding effects of the use of frustration range materials.

Range of text difficulty was not a factor in the production of differential rates of basic miscues, types of substitution errors, or reversal errors for the LD readers used in this study. Therefore, it does not appear necessary to differentiate the difficulty range of materials used for LD readers in studies related to these areas.

The second question asked is there were any differences in the miscues produced by the four grade levels in this study. The differences in grade level appeared in two ways.

First, the eighth graders produced significantly more substitution errors than any of the LD readers at the other grade levels. The examination of these data for LD readers does not allow us to determine whether or not this is a pattern that applies to normal readers at these levels as well as to LD readers, but this is a question that may be of interest in further studies.

Second, the eleventh grade group was found to produce a greater mean percentage of linguistically acceptable miscues than the other three grade level groups, unrelated to overall miscue rate. It may be that, because these readers have had a longer contact with text than the younger readers, they are in better contact with the syntactic and semantic structure of text than the younger readers. If we can make this assumption, we can conclude that there is a rationale for encouraging LD readers to continue to practice reading skills thoughout their school years, because comprehension, as measured by linguistic acceptability rates, continues to improve through these years.

The third research question related to the rates of production of the various miscue types, exclusive of the effects of grade level and difficulty range of the materials. Substitutions were found to be the miscue type with the highest rate of production. We can speculate that this differential rate may be related to the nature of the definition of the category, which includes all substitutions

and all mispronunciations. The other categories are somewhat more limited in the types of miscues that are included. Conversely, it may be the case that this high rate of substitution miscues is the result of some undetermined characteristic strategy used by these LD readers, or by readers in general. The data from this study do not the reason for this differential rate of production of substitution miscues.

In observing the differences in rate for the types of substitution errors, it is clear that these LD readers have problems with attending not to the phonetic regularities, but to the details of the graphophonic structure of text. They have problems with suffixes rather than prefixes, irregular rather than regular words, with substituting an inflection or form of the text word. These characteristics carry instructional implications: that the instruction in word recognition for LD readers is relatively effective for regular words, and for the initial portions of words, but irregular words and word parts after the initial letters require additional attention.

In summary, the basic premise of this study was that the production of various miscue patterns has been mistakenly viewed as characteristic of LD readers, when in fact it is more accurately attributed to the use of frustration rather than instructional range materials. This premise was supported by the results of this study.

Authors' Notes

This paper was presented at the 1988 annual meeting of the National Reading Conference in Tucson, Arizona, in December 1988.

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Table 1. The Main Effect for Basic Miscue Type: The Results of Tukey's Procedure.

Group	Mean	Sig (.01)
Substitutions	76.42	*
Teacher-Pronounced	10.40	
Insertions	7.52	
Omissions	5.74	

* Note that for any means enclosed within one bracket, there are no significant differences between or among the means. Significant differences occur only between or among means within one bracket and the means in the bracket or brackets below it.

Table 2. The Main Effect for Grade and for Substitution Type: Results of Tukey's Procedure.

Main Effect for Grade

Group	Mean	Sig (.01)
Grade 8	10.83	*
Grade 5	8.49	
Grade 2	8.45	
Grade 11	7.67	

Main Effect for Substitution Type

Group	Mean	Sig (.01)
Irregular	18.51	*
Whole word	17.08	
Inflection	13.33	
Suffix	11.39	
Nonsense	10.95	
Proper nouns	4.97	
One error to correct another	2.14	
Prefix	1.14	
Stress	.22	

* Note that for any means enclosed within one bracket, there are no significant differences between or among the means. Significant differences occur only between means within one bracket and the means in the bracket or brackets below it.

Table 3. The Main Effect for Reversal Type: Results of Tukey's Procedure.

Group	Mean	Sig (.01)
Total Reversals	6.98	*
Word Part	5.31	
Letter	.75	
Phrase	.69	
Word	.37	

* Note that for any means enclosed within one bracket, there are no significant differences between or among the means. Significant differences occur only between means within one bracket and the means in the bracket or brackets below it.

Table 4. The Main Effects for Grade, and for Linguistic Acceptability Type: Results of Tukey's Procedure.

Main Effect for Grade

Group	Mean	Sig (.01)
Grade 11	55.08	*
Grade 8	50.72	
Grade 5	49.37	
Grade 2	48.68	

Main Effect for Acceptability Type

Group	Mean	Sig (.01)
Syntactic to Error	84.39	*
Semantic to Error	80.73	
Syntactic with Sentence	43.43	
Semantic with Sentence	34.64	
Semantic with Author's Intent	11.62	

* Note that for any means enclosed within one bracket, there are no significant differences between or among the means. Significant differences occur only between means within one bracket and the means in the bracket or brackets below it.